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Serial No. 09/895,452

LISTING OF THE CLAIMS:

1. In a television-based system, a method comprising:
receiving at a set top box video information transmitted from a source, the video information including a plurality of page images and meta-data associated with the page images;
detecting at the set-top box a user request to display one of the plurality of page images;
selecting a page image based on the user request;
outputting video signals representing the selected page image from the set-top box, the meta-data associated with the page image identifying an active input location on the page image;
controlling an on-screen display mechanism in the set-top-box to interact with the user and receive user entered data at the active input location; and
communicating the user entered data from the set-top box to a remote computer.
2. In an audiovideo data transmission environment comprising a source and at least one receiver, a method comprising:
transmitting a stream of video data from the source to the receiver, including transmitting a plurality of pages of content in a substantially recurring pattern to the receiver;
receiving the video data at the receiver;
displaying a desired page of the plurality of pages, including waiting a latency time until the desired page in the recurring pattern is received; and
wherein in the recurring pattern, the source transmits one of the pages more frequently than another page, such that when the desired page is the page that is transmitted more frequently, an average latency time for displaying the more frequently transmitted page is less than an average latency time for displaying the other page when the other page is the desired page.

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3. A method of outputting video signals at a receiver, comprising:
receiving a stream of video data from a source including a page to display, the page comprising metadata and image data including at least one input mechanism element that when displayed appears as being configured to receive user input data;
outputting video signals to display the page as a first image, including displaying the input mechanism element;
receiving an interactive command at the receiver directed to the input mechanism element; and
in response to the interactive command, the receiver interpreting the metadata to determine how a second image should be superimposed over the first image, the receiver outputting video signals to display the second image over the first image to provide visual feedback indicative of interaction with the input mechanism element.
4. The method of claim 3 wherein the input mechanism element appears as a button, wherein the interactive command corresponds to a requested selection of the button, and wherein outputting video signals to display the second image comprises, rendering at least part of a border around the button to represent the button as having been pressed.
5. The method of claim 4 further comprising, outputting additional video signals to modify the border rendered around the button to represent the button as having been released.
6. The method of claim 3 wherein the input mechanism element appears as a checkbox, wherein the interactive command corresponds to a requested selection of the checkbox, and wherein outputting video signals to display the second image comprises, superimposing an image over the checkbox to represent the checkbox as having been selected.

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7. The method of claim 3 wherein the input mechanism element appears as a set of radio buttons, wherein the interactive command corresponds to a requested selection of one of the radio buttons, and wherein outputting video signals to display the second image comprises, superimposing an image over a selected one of the radio buttons to represent the radio button as having been selected, and removing the superimposition of any images over radio buttons that were not selected.
8. The method of claim 3 wherein the input mechanism element appears as a field for entering alphanumeric characters, wherein the interactive command corresponds to an alphanumeric character directed to the field, and wherein outputting video signals to display the second image comprises, superimposing an alphanumeric character over at least part of the field.
9. The method of claim 8 wherein the field for entering alphanumeric characters is directed to receiving a personal identification number.
10. The method of claim 8 wherein the field for entering alphanumeric characters is directed to receiving at least part of a user's credit card information, and further comprising, maintaining the credit card information at the receiver until data corresponding thereto can be later polled.
11. The method of claim 10 further comprising, linking to an error page upon detecting that the credit card information is invalid.
12. The method of claim 3 wherein the page further comprises another input mechanism element that appears as a reset button, and further comprising, after receiving the interactive command directed to the

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input mechanism element, receiving another interactive command at the receiver directed to the reset button, and in response to the other interactive command, the receiver modifying at least part of the visual feedback that was previously provided to indicate a reset operation.

13. The method of claim 12 wherein the input mechanism element appears as a field for entering alphanumeric characters, wherein the interactive command corresponds to an alphanumeric character directed to the field, wherein outputting video signals to display the second image comprises superimposing an alphanumeric character over at least part of the field, and wherein modifying at least part of the visual feedback comprises clearing the field of at least one superimposed alphanumeric character.

14. In an audiovideo transmission environment, a method comprising:
receiving a stream of video data from a source including a page to display, the page comprising metadata and image data including at least one input mechanism element that when displayed represents an interactive purchase button;
receiving an interactive command from a user of the receiver directed to a purchase request via the purchase button; and
in response to the interactive command, the receiver providing information corresponding to the purchase request to an external server, the external server having access to payment information maintained for that user.

15. The method of claim 14 wherein the external server is a polling server that obtains the information corresponding to the purchase request from the receiver.

16. The method of claim 15 wherein the polling server further obtains the payment information

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from the receiver.

17. The method of claim 14 wherein the external server obtains the information corresponding to the purchase request from the receiver, and separately obtains the payment information from an information source external to the receiver.

18. The method of claim 14 further comprising, sending an electronic mail notification to the receiver to indicate receipt of the purchase request.

19. A method of representing user interaction with a displayed image, comprising:
receiving a page to display, the page comprising metadata and substantially static, high-quality image data;

outputting video signals to display a high-quality image based on the high-quality image data, and further outputting video signals based on the metadata to superimpose a relatively low-quality image over the high-quality image;

receiving an interactive command at the receiver; and

in response to the interactive command, the receiver modifying the low-quality image to provide visual feedback indicative of real-time interaction with the input mechanism element.

20. In an audiovideo data transmission environment comprising a server source and at least one client receiver, a method comprising:

transmitting a stream of video data from the server source to the client receiver, including transmitting a plurality of pages of image data and metadata injected into the stream in a pattern;

receiving the video data at the receiver, the client receiver displaying a selected one of the pages of the

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plurality; and

the server source changing the page transmitted in the pattern that corresponds to the selected page by inserting a new page in place of an old page in the pattern on a substantially regular basis, thereby controlling at the server source a slide show from the perspective of the client receiver that is displaying the selected page.

21. The method of claim 20 wherein the page metadata includes an automatic link to itself such that the client receiver reacquires page metadata of the new page when the new page is received.

22. In an audiovideo data transmission environment comprising a server source and at least one client receiver, a method comprising:

transmitting a stream of video data from the server source to the client receiver, including transmitting a plurality of pages of image data and metadata injected into the stream in a pattern;

receiving the video data at the client receiver, the client receiver displaying a selected one of the pages of the plurality, the selected page metadata including a automatic link to another page; and

interpreting the automatic link at the client receiver to display the other page in the pattern, the other page displayed when received at the receiver.

23. In a receiver of audiovideo data transmitted from a source, a method comprising:

receiving a stream of video information from the source, including a page to display at the receiver, the page including data representing at least one link for selecting a program on a corresponding viewing channel;

displaying the page;

receiving an interactive command directed to selection of the link; and

in response to the interactive command, processing the page to determine if the selection has a time associated therewith, and

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- 1) if the selection does not have an associated time, tuning to the channel, and
 - 2) if the selection has an associated time, determining whether the associated time is in the future, and if not in the future, tuning to the channel, and if in the future, adding data corresponding to the selection to a timer for timed selection of the channel.
24. The method of claim 23 further comprising, determining whether the selection corresponds to a pay-per-view event, and if so, prompting for purchase confirmation of the event before tuning to the channel or adding data corresponding to the selection to a timer.
25. The method of claim 23 wherein the selection corresponds to a time in the future, and further comprising, prompting for a command to add the selection to the timer and receiving the command before adding the selection to the timer.
26. In a receiver of audiovideo data streamed from a source, a method comprising:
receiving a page to display at the receiver from the source, the page comprising image data representing a form for submitting information from the receiver to a server and metadata describing how commands from the receiver are to be interpreted with respect to obtaining the information for submitting to the server;
receiving information for submitting to the server;
receiving data indicating that the page is to no longer be displayed, without having received an explicit user command to submit the information to the server; and
automatically submitting the information to the server.
27. The method of claim 26 further comprising, determining that the information should be automatically submitted to the server by processing the metadata to locate data indicative of automatic

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submission.

28. The method of claim 26 wherein submitting the information to the server comprises maintaining the information in a storage at the receiver such that the server has later access to the information.

29. In a receiver of audiovideo data transmitted from a source, a method comprising:
receiving from the source a stream of video data including a page to display at the receiver, the page comprising image data representing a form for submitting information from the receiver to a server and metadata describing how commands from the receiver are to be interpreted with respect to obtaining the information for submitting to the server;
receiving information for submitting to the server; and
receiving an explicit user command to submit the information to the server, and in response, processing the metadata to determine whether the metadata contains data indicating that a destination page that the source provides is to be displayed in response to the command to submit the information, and if so, automatically displaying the destination page.

30. (Added) In an audiovideo data transmission environment comprising a head-end source and at least one subscriber, a method comprising:
receiving an electronic mail message at the source, the electronic mail message addressed to a specific subscriber;
enabling a set-top box of the specific subscriber to receive data corresponding to the electronic mail message via out-of-band transmission; and
transmitting the electronic mail message to the specific subscriber.

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31. The method of claim 30 wherein the specific subscriber submits form information corresponding to a form page to server in conjunction with an electronic mail address thereof, and wherein the server generates an electronic mail message to confirm receipt of the form information and provides the electronic mail message addressed to the specific subscriber for transmission thereto.

32. In a receiver of audiovideo data transmitted from a source, a method comprising:
receiving at the receiver a plurality of pages of content transmitted in a stream of video data from the source;
receiving at the receiver television programs transmitted from the source;
tuning the receiver to a channel to output video information corresponding to a television program; and
receiving at the receiver a command to display one of the pages of content, and in response, determining whether the channel to which the receiver is tuned is a subscriber channel having at least one page of content corresponding thereto in the plurality, and if so, displaying a page of content for that subscriber channel, and if not, displaying a home page.

33. In a receiver of audiovideo data transmitted from a source, a method comprising:
receiving a stream of video information from a source, the video information including a plurality of pages of content comprising image data and metadata;
displaying one of the pages as a first image;
interpreting metadata on the page to locate at least one link to another page and determine a default link; and
drawing focus on the default link by superimposing a second image over the first image.

34. The method of claim 33 wherein the default link is determined by an order of information in the

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metadata that is related to each link.

35. The method of claim 33 wherein the page includes a plurality of links, and further comprising, receiving a command directed to moving from a focused link to another link, and modifying the second image to remove focus from the focused link and draw focus on the other link.

36. The method of claim 35 wherein the command corresponds to a direction, and wherein moving from the focused link to the other link comprises, interpreting a focus chain in the metadata based on the direction to determine where focus is to be next drawn.

37. In a receiver of audiovideo data transmitted from a source, a method comprising:
receiving at the receiver a plurality of pages of content transmitted in a stream of video data from the source;
receiving at the receiver television programs transmitted from the source;
displaying at the receiver a page including data representing at least one link directed towards a program channel and at least one link directed towards another page;
displaying the page;
receiving an interactive command at the directed to selection of one of the links; and
in response to the interactive command, processing the page including interpreting the metadata to determine if the command is directed towards a program channel, and if so, tuning to the channel, and if not, determining another page to display based on the command, and displaying the other page.

38. A method of outputting video signals at a receiver, comprising:
receiving a stream of video data from a source including a page to display, the page comprising

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metadata and image data including at least one input mechanism element that when displayed appears as being configured to receive user input data;

outputting video signals to display the page as a first image, including displaying the input mechanism element;

receiving an interactive command at the receiver directed to the input mechanism element; and

in response to the interactive command, updating a second image superimposed over a separate read-only field provided in the first image to provide visual feedback indicative of interaction with the input mechanism element.

39. The method of claim 38 wherein the input mechanism corresponds to a field for entering purchase information, wherein the second image corresponds to a total price value, and wherein updating the second image comprises calculating the total price value based on the command directed to the input mechanism, and outputting video signals to display a representation of the total price superimposed over the separate read-only field.

40. In a source of audiovideo data transmitted to a plurality of subscriber receivers, a method comprising:

- (a) providing a new page of content for a carousel of pages;
- (b) modifying metadata for other pages in the carousel that contain links to the new page;
- (c) modifying metadata for the new page for each other page that is linked to by the new page;
- (d) repeating steps (a) - (c) until at least some of the pages in the carousel of pages are determined to be ready for transmission; and
- (e) injecting each page in the carousel onto a transmission medium for transmission to the subscriber receivers.

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41. The method of claim 40 wherein step (e) is repeated on a regular basis until at least one other new page is provided, and when the at least one other new page is provided, returning to step (b).

42. A computer-implemented method comprising:

receiving, at a first phase post-processing tool, an authored page of data corresponding to an image to display, the first phase post-processing tool providing output data to a second phase post-processing tool by:

(a) adjusting the page data as needed such that the image will properly reside within a safe area of an overscanned television raster;

(b) determining from a page layout a set of metadata that defines how a second image should be superimposed on links and form elements; and

(c) encoding the metadata using client-side tags;

and

receiving, at the second phase post-processing tool the output data of the first phase post-processing tool, the second phase post-processing tool:

(a) coding the page image as a single video frame; and

(b) processing at least one of the tags to generate focus descriptors for each page element.

43. In an audiovideo data transmission environment comprising a head-end source and at least one receiver, a method comprising:

at the source, transmitting audiovideo information including a plurality of pages to the receiver, each page including data separately transmitted in a stream of data to the receiver, wherein part of the information transmitted with each transmitted page comprises at least one block of encoded audio data;

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displaying one of the pages at the receiver,
providing audio output based on the encoded audio data received with the displayed page; and
while the one page is being displayed, processing the encoded audio data received with at least one other
page to provide further audio output.

44. The method of claim 43 further comprising, buffering the audio information from each page.

45. The method of claim 43 further comprising, regularly changing the audio information
associated with each page of the plurality to provide audio output corresponding to a real-time audio
broadcast.

46. In a source of audiovideo data transmitted to a plurality of receivers, a method comprising:
selecting a first page of a plurality of pages based on at least one criterion;
injecting the first page into a stream of data transmitted to the receiver;
selecting a second page based on the at least one criterion; and
injecting the second page into the stream of data transmitted to the receiver; and
(e) repeating steps (a) - (d) such that the at least one criterion determines a frequency of transmitting the
first page relative to a frequency of transmitting the second page.